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# Pharmacy practice in emergency response during the COVID-19 pandemic: Lessons from Australia

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## ARTICLE INFO

### Keywords:

Pharmacy  
Pharmacist  
Australia  
COVID-19

## ABSTRACT

The purpose of this paper is to provide an overview of the pharmacy practice and initiatives taken by the Australian federal government to ensure the continued supply of essential medicines under the conditions of an emergency response plan for COVID-19. During the pandemic, Australian pharmacists have been working collaboratively with multidisciplinary teams at the frontline to manage the equitable and safe supply of medicines despite the unprecedented situation. Although these presented problems for small pharmacies, social distancing policies were implemented widely to maintain personal and environmental hygiene and reduce the number of face-to-face patient visits. In collaboration with various pharmaceutical stakeholders, the Australian government responded rapidly to ensure equitable and sufficient supply with continued access to therapeutic goods during the pandemic. Additionally, vital policies and practices have been implemented, including supplying regular medicines at government-subsidized prices, a maximum one-month supply of some prescription medicines and purchase limits on over-the-counter medicines (one unit per purchase), medication management reviews through telehealth, electronic and digital prescribing, home delivery of medicines to vulnerable people and those in home isolation and the provision of serious shortage medicine substitution rights to pharmacists. Pharmacists were encouraged to communicate and collaborate with other local pharmacies to ensure that essential pharmacy services met community needs (e.g., opening hours). However, there has been a shortage of some medicines due to supply chain disruption and increased demand due to the pandemic. Higher demand for flu vaccinations, increased work pressure in pharmacies, and severe frustration and anxiety in pharmacy customers were also reported. Vigilance is required to monitor foreseeable shortages of therapeutics goods, particularly in regional pharmacies. There is an opportunity for long-term change to retain certain rights and roles based on the competence shown by pharmacists in this challenging period, such as telephone medication reviews, telehealth for MedsCheck and Diabetes MedsCheck, digital prescription handling and therapeutic substitution.

## 1. Background

The 2019 coronavirus pandemic (COVID-19) caused by the novel severe acute respiratory syndrome coronavirus 2 (SARS COV-2) is a global public health crisis. Health care access has been severely affected and changed across the globe. The first case of COVID-19 in Australia was identified on January 25, 2020, in Victoria.<sup>1</sup> By March 20, 2021, the

number of confirmed COVID-19 cases had risen to 29,183, and there have been 909 deaths in Australia.<sup>2</sup> Since the World Health Organization (WHO) declared COVID-19 pandemic on March 11, 2020,<sup>3</sup> Australians have been overwhelmed by constantly changing health alerts and messages such as continuous media coverage of the disease and the projected economic impacts associated with the pandemic. Community transmission was detected within 40 days of the first COVID-19 case

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<https://doi.org/10.1016/j.sapharm.2021.08.013>

Received 11 November 2020; Received in revised form 31 July 2021; Accepted 29 August 2021

Available online 30 August 2021

1551-7411/© 2021 Published by Elsevier Inc.

confirmation.<sup>4</sup> Australian federal, state, and territory governments have effectively implemented emergency preparation and rapid response to control the spread of the virus. These have included domestic and international travel restrictions, physical or social distancing rules, quarantine and isolation principles, and online platforms for work and education.<sup>5</sup> Travel restriction was particularly implemented for areas where there was international or internal community transmission. Australia was one of the first countries to close its borders to China. Moreover, Australia followed New Zealand to be the second country to declare the closure of borders to international travelers. However, Australian permanent residents and citizens could travel if they adhered to the 14-day quarantine requirement. Vulnerable people such as the elderly, children, pregnant women, and people with multiple comorbidities were requested to take extra precautions due to the increased risk of COVID-19 infection.

Australia is at high risk of supply chain disruption in a pandemic situation because the country imports more than 90% of its medicines; this poses a challenge to timely access to medicines, creating a high risk of medication shortage.<sup>6</sup> Despite the supply crisis during the pandemic, the strengths of the Australian health care system play a crucial role in coping with the challenges, including the Pharmaceutical Benefits Scheme (PBS) and the Medicare Benefits Scheme, which subsidize essential health care services and medicines for Australian people.<sup>7</sup>

Pharmacists are well equipped with the knowledge and skills to provide medication-related information to patients, clinical staff, and other health care providers during an epidemic outbreak while also ensuring the continued supply of medications.<sup>8</sup> Several reports have highlighted the significant contributions of pharmacists during previous epidemic outbreaks. For example, pharmacists were actively involved in medication-related provisions and patient care in Canada during the 2003 severe acute respiratory syndrome (SARS) outbreak<sup>9,10</sup>; vaccination activities during the 2010 influenza A virus subtype H1N1 (H1N1) outbreak and the 2019 measles outbreak in the USA<sup>11</sup>; and the development of a vaccine trial research center in Liberia following the Ebola outbreak in 2014–2015.<sup>12</sup>

During the current COVID-19 crisis, pharmacies have been expected to stay open to serve people by ensuring the continued supply of essential medicines amid government-enforced lockdowns in many states and countries. A recently published review paper<sup>13</sup> highlighted that pharmacists occupied a range of roles in battling the COVID-19 crisis: providing patient-centered care such as the use of e-prescriptions, preparing hydroalcoholic hand-sanitizing gels in pharmacies, and providing remote consultations. As a contingency measure, pharmacists in the UK were provided with the lawful responsibility to supply certain controlled drugs to patients without a prescription.<sup>13</sup> Similarly, pharmacists in Canada have been allowed to extend and renew prescription orders, and some pharmacies in the USA were designated COVID-19 testing sites.<sup>13</sup> Additionally, during the outbreak, pharmacists in China were involved in medication supply chain management, preparation of drug formulations, establishment of remote pharmacy services, provision of medication reviews to reduce the risks associated with medication use, promotion of medication adherence, and the development of self-confidence to overcome diseases.<sup>14,15</sup> In India, pharmacists were participating in medication procurement and the preparation and distribution of patient communication materials.<sup>16</sup> In some countries, pharmacies are preparing well for COVID-19 vaccines administration.<sup>17,18</sup> All this evidence demonstrates that pharmacists occupied a vital and broadening role during the pandemic, necessitating investigation of how they integrate into the coordinated workforce emergency response. Further, pharmacists are not only coping with the burden of COVID-19, but also playing a significant role in multidisciplinary team thorough clinical trials and drug development process.<sup>19</sup>

To thoroughly guide pharmacists and other pharmacy personnel regarding managing the COVID-19 situation, the International Pharmaceutical Federation (FIP) has been providing updates through its FIP COVID-19 information hub. These updates are based on available evidence and the recommendations of the WHO, the US and European Centers for Disease

Control and Prevention, and other relevant bodies.<sup>20</sup> FIP has initiated several approaches, such as disseminating evidence-based information in consultation with global experts, digital response, and policy and practice guidelines for pharmaceutical practice.<sup>21</sup> Australian guidelines for pharmacists regarding COVID-19 align closely with the FIP guidelines.<sup>22</sup> Recently, a commentary paper by Nguy et al. (2020) described the contribution of the hospital pharmacist in an Australian hospital toward managing COVID-19 cases.<sup>23</sup> In this paper, we provide an overview of the pharmacy practice and initiatives adopted by the Australian federal government to ensure the continued supply of essential medicines and pharmaceutical services under the state of an emergency response plan for COVID-19 and this could be a lesson for many countries.

### 1.1. Australian emergency response to COVID-19

Major pharmaceutical stakeholders in Australia, including the Pharmaceutical Society of Australia (PSA) (professional society), the Pharmacy Guild of Australia (pharmacy owners' organization representing community pharmacies), the National Pharmaceutical Services Association (NPSA) (representing pharmaceutical wholesalers), the Society of Hospital Pharmacists of Australia (SHPA), and the Therapeutic Goods Administration (TGA), have aligned to support the government's strategic plan for fighting COVID-19. In the following sections of this paper, we discuss how the Australian government and pharmaceutical organizations work collaboratively to ensure the continued supply of essential medicines, protect pharmacists from abuse and, ultimately, minimize the shortage of therapeutics goods across the country.

#### 1.1.1. The Australian government emergency response plan against COVID-19

Australian governments, at the federal, state, and territory levels, have initiated several policies and practice regulation changes for the continued supply of essential medicines following the COVID-19 outbreak to ensure pharmacy service quality and patient safety. These strategies include access to regular medications under the PBS subsidized rates (until March 31, 2021), home delivery service for PBS and Repatriation PBS medicines to vulnerable people and those in home isolation (up to one month),<sup>24</sup> and digital image prescriptions.<sup>25</sup> Immediately after the COVID-19 crisis, the Australian federal government expanded the list of medications (the majority of prescription-only medications, Schedule 4 category) that pharmacists can dispense for up to one month to eligible patients, particularly if a patient is unable to obtain an updated prescription from a doctor, and there is a need for continuity of treatment.<sup>25</sup> Prescribers can send patients a digital image of the prescription via either fax, email, or text message to a specific pharmacy of choice. These prescriptions can be filled and delivered to the residence of vulnerable people, such as people over 70 years of age (or over 50, if identified as Aboriginal and/or Torres Strait Islander), people taking multiple medications for multiple chronic conditions, parents with new babies or pregnant women, and those in home isolation. The right to substitute medication was provided to pharmacists if a particular dose and dosage form of the medication is not available while dispensing. For example dispensing two 20 mg tablets instead of 40 mg tablet of a given medicine, or dispensing capsules instead of tablets.<sup>26</sup> The TGA has published a list of prescription (see [Tables 1 and 2](#)) and OTC medicines (see [Table 3](#)) for which there is a high possibility of interrupted supply and increased demand.<sup>27</sup> Pharmacists are required to dispense prescription medications up to a maximum of one month and one unit per purchase of OTC medicines to ensure continued and equitable access to counterbalance increased demand and projected interruption in supply. Other initiatives implemented by the government include allowing pharmacists to undertake a telephone medication review, telehealth for MedsCheck and Diabetes MedsCheck, continued dispensing of essential medicines at PBS prices, and digital image prescribing.<sup>28</sup> The MedsCheck and Diabetes MedsCheck services involve the provision of an in-pharmacy one-on-one discussion and medication

**Table 1**

Medicines where interrupted supply could result in serious health consequences – prescription medicines.

Pharmacists are required to limit dispensing of the below prescription medicines to one month's supply at the prescribed dose.		
Category	Class	Medicine Name/s (examples only)
Analgesics	Opioids, NSAIDs, gabapentinoids	Tramadol, oxycodone, fentanyl, hydromorphone, tapentadol, morphine, methadone, celecoxib, pregabalin etc.
Anaphylaxis treatment	Adrenaline	Adrenaline
Anti-anginals	Isosorbide mononitrate, glyceryl trinitrate	Isosorbide mononitrate, glyceryl trinitrate
Anti-arrhythmics	Digoxin, amiodarone, flecainide etc.	Digoxin, amiodarone, flecainide etc.
Anti-coagulants	Warfarin, rivaroxaban, dabigatran, apixaban, enoxaparin	Warfarin, rivaroxaban, dabigatran, apixaban, enoxaparin
Anti-depressants	TCAs, SSRIs, SNRIs, MAOIs	Amitriptyline, sertraline, venlafaxine, moclobamide etc.
Anti-diarrhoeals	Opioid antidiarrhoeals	Loperamide, diphenoxylate
Anti-epileptics	Carbamazepine, lamotrigine, phenytoin, topiramate, valproate, levetiracetam etc.	Carbamazepine, lamotrigine, phenytoin, topiramate, valproate, levetiracetam etc.
Anti-hypertensives	Ramipril, irbesartan, metoprolol, dihydropyridines, methyl dopa etc.	Ramipril, irbesartan, metoprolol, dihydropyridines, methyl dopa etc.
Anti-parkinson drugs	Carbidopa/levodopa, levodopa/benserazide	Carbidopa/levodopa, levodopa/benserazide
Anti-platelets	Clopidogrel, aspirin, ticagrelor, prasugrel	Clopidogrel, aspirin, ticagrelor, prasugrel
Anti-psychotics	Olanzapine, risperidone, aripiprazole, paliperidone, quetiapine	Olanzapine, risperidone, aripiprazole, paliperidone, quetiapine
Anti-virals	e.g. treatments for hepatitis c	e.g. treatments for hepatitis c
Benzodiazepines	Diazepam, clonazepam etc.	Diazepam, clonazepam etc.
Cancer/Palliative care medicines	Chemotherapy and symptom management (anti-nauseants etc).	Chemotherapy and symptom management (anti-nauseants etc).
Diuretics	spironolactone, frusemide, HCT	spironolactone, frusemide, HCT
Endocrine medicines	Thyroxine, carbimazole/PTU, hydrocortisone etc.	Thyroxine, carbimazole/PTU, hydrocortisone etc.
Gastrointestinal medicines	Pancreatic enzymes	Pancreatic enzymes
Glaucoma eye drops	Beta-blockers, prostaglandin analogues	Timolol, latanoprost
Immunosuppressants	Steroids, DMARDs, bDMARDs	Prednisolone, methotrexate, adalimumab etc.
Insulins	Multiple	Multiple
Oral contraceptives	Multiple	Multiple
Oral hypoglycemics	Sulfonylureas, DPP4s, SGLT2is, GLP1s	Metformin, glicazide, sitagliptin, empagliflozin, exenatide etc.
Respiratory	B2 agonists, anticholinergics, inhaled corticosteroids, theophylline, montelukast	Multiple

NSAIDs, Nonsteroidal anti-inflammatory drugs; TCAs, tricyclic antidepressants; SSRIs, selective serotonin reuptake inhibitors; SNRIs, Serotonin–norepinephrine reuptake inhibitors; MAOIs, monoamine oxidase inhibitors; DMARDs, disease modifying antirheumatic drugs; bDMARDs, biological disease modifying antirheumatic drugs; DPP4s, Dipeptidyl peptidase 4 inhibitors; SGLT2is, Sodium-glucose co-transporter-2; GLP1s, glucagon-like peptide-1 receptor agonists; HCT, Hydrochlorothiazide; PTU, propylthiouracil.

Adapted from the *Limits on dispensing and sales of prescription and over-the-counter medicines*, 2020, Therapeutic Goods Administration, used with permission of the Australian government <https://www.tga.gov.au/media-release/limits-dispensing-and-sales-prescription-and-over-counter-medicines> (Access data: 02/07/2020).

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**Table 2**

Medicines that may be subject to increased demand due to COVID-19 symptom management – prescription medicines.

Pharmacists are required to limit dispensing of the below prescription medicines to one month's supply at the prescribed dose.		
Category	Class	Medicine Name/s (examples only)
Asthma/COPD (chronic obstructive pulmonary disease)	Short acting B2 agonist	Salbutamol, Terbutaline – inhaled
	LABA, long-acting beta2 agonist	Salmeterol, Formoterol, Indacaterol, Vilanterol - inhaled (including in combination inhalers)
	SAMA, short-acting muscarinic antagonist	Ipratropium - inhaled
	LAMA, long-acting muscarinic antagonist	Tiotropium, aclidinium, umeclidinium, glycopyrronium - inhaled
	ICS, inhaled corticosteroid	Fluticasone propionate, fluticasone, furoate, budesonide, beclomethasone, ciclesonide, olodaterol - inhaled (including in combination inhalers)
	Leukotriene receptor antagonist	Montelukast sodium - oral
	Cromones (mast cell stabilisers)	Sodium cromoglycate - inhaled, nedocromil sodium - inhaled
	Theophyllines	Theophylline
	Anti-IgE	Omalizumab
	Anti-IL-5 receptor	Benralizumab
	Anti-IL-5	Mepolizumab
	Systemic corticosteroid	Prednisolone - oral, dexamethasone - oral
	Adrenaline	Adrenaline
	Saline	Saline - inhaled
Cystic Fibrosis medicines	Cystic fibrosis transmembrane conductance regulator (CFTR) protein progenitor	Ivacaftor, lumacaftor/ivacaftor, tezacaftor/ivacafto
Anti-infectives	Antibiotic	Amoxycillin – oral, Amoxycillin and clavulanate – oral, Doxycycline – oral, Clarithromycin – oral, Cefuroxime – oral, Moxifloxacin – oral, Azithromycin – oral, Ciprofloxacin – oral, Moxifloxacin – oral, Clindamycin – oral, Benzylpenicillin – injection, Ceftriaxone – injection, Erythromycin – oral, Roxithromycin – oral
Influenza medicines	Neuraminidase inhibitors	Oseltamivir, zanamivir
Vaccines	Vaccine	Influenza vaccines – injected, Pneumococcal vaccinations - injected
Oxygen	Domiciliary Oxygen Therapy	Oxygen - inhaled

Adapted from the *Limits on dispensing and sales of prescription and over-the-counter medicines*, 2020, Therapeutic Goods Administration, used with permission of the Australian government <https://www.tga.gov.au/media-release/limits-dispensing-and-sales-prescription-and-over-counter-medicines> (Access data: 02/07/2020).

**Table 3**

Medicines where interrupted supply could result in serious health consequences – non-prescription medicines.

Pharmacists are required to limit dispensing of the below non-prescription medicines to one month's supply at the prescribed dose.	
Medicines where interrupted supply could result in serious health consequences - non-prescription	Medicines that may be subject to increased demand due to COVID-19 symptom management - non-prescription
Adrenaline auto-injector	Anti-histamines
Chloramphenicol eye drops/ointment	Cough suppressants
Glyceryl trinitrate (GTN)	Decongestants
Levonorgestrel	Expectorants
Naloxone	Ibuprofen
Salbutamol	Mucolytics
	Aspirin
	Paracetamol
	Throat preparations (lozenges, gargles)

Adapted from the *Limits on dispensing and sales of prescription and over-the-counter medicines*, 2020, Therapeutic Goods Administration, used with permission of the Australian government <https://www.tga.gov.au/media-release/limits-dispensing-and-sales-prescription-and-over-counter-medicines> (Access data: 02/07/2020).

review by a pharmacist. These services aim to address concerns or questions a person may have about their medications.

The TGA has been working actively against opportunistic and unlawful activity during the COVID-19 pandemic. For example, several companies were recently fined up to \$63,000 for unlawfully advertising their products to be effective against COVID-19.<sup>29</sup> Notably, on April 8, 2020 (and to be valid until January 31, 2021), the TGA encouraged the domestic manufacture and supply of ventilators despite their registration as an Australian Register of Therapeutic Goods product. However, the use of these ventilators is limited within the context of COVID-19 as per the notice.<sup>30</sup> The TGA was the first body to announce a severe shortage of metformin modified release 500 mg tablets. This presented the opportunity for pharmacists—they were granted the legal right to substitute strength, dose, or form (e.g., extended, sustained, or immediate release) (valid until December 31, 2020 as per current notice). However, they were asked to notify the prescriber immediately, patients must present with a valid prescription, and the total quantity supplied should be equivalent to the number of days provided in the original prescription.<sup>31</sup> On July 1, 2020, the TGA recommended that pediatric paracetamol be placed at the front counter, whereas previously (announced in March 2020) it was to be placed behind the counter due to unexpectedly high demand.<sup>27</sup>

The Australian government has invested more than \$3.3 billion in four separate agreements to supply COVID-19 vaccines if proven to be safe and effective.<sup>32</sup> As of March 25, 2021, two vaccines (developed by Pfizer/BioNTech and AstraZeneca/University of Oxford) have been approved by the TGA for provisional use. Community pharmacies are central to the Australian government's vaccine rollout program. The call for the expression of interest for community pharmacies to participate in the governments' Phase 2A vaccine rollout program has been recently closed. Under this program, the pharmacies will provide AstraZeneca/Oxford vaccines; they will not provide Pfizer/BioNTech vaccines as it requires very extreme storage conditions. The government will facilitate the supply of vaccines to the selected pharmacies, provide payment per vaccination delivered, and provide vaccine-specific training and access to the National Booking System.<sup>33</sup>

#### 1.1.2. The Pharmaceutical Society of Australia emergency response plan for COVID-19

The PSA is a peak professional body of approximately 34,000 pharmacists across Australia. The PSA has been advocating consistently regarding pharmacists' roles and strengthening the pharmacy profession to its full potential by empowering its members with the necessary skills

and experience.<sup>28</sup> The society has provided updated information regularly regarding dealing with the COVID-19 crisis via its website exclusively to its members based on federal government updates about the strategic plan for battling COVID-19. The association continues to disseminate government policies and plans that respond to the current pandemic, such as protecting pharmacists from violence and abuse and acknowledging the government's commitments. The PSA also encouraged members to use the COVIDSafe app to support the government to efficiently trace and quickly contact people who may have been exposed to COVID-19.

An inexpensive and commonly used steroid drug (dexamethasone) was promoted widely as an effective medicine for the management of COVID-19 following the success of the RECOVERY trial in the UK. However, the results were still preliminary.<sup>34</sup> Recently, the PSA advised that the trial's outcome applies only to critically ill and hospitalized COVID-19 patients in ventilated or oxygenated conditions but that it does not apply to mild cases or as a prophylactic. Further, as the TGA notified the PSA, Australia currently has sufficient dexamethasone injections or tablet stock; there are no warnings regarding a potential shortage.<sup>28</sup> The PSA is working collaboratively with the TGA, SHPA, the Pharmacy Guild, and NPSA toward the common goal of continued medicine supply across the nation.

The PSA recently introduced an action plan, "Pharmacists in 2023," with the vision of improving medicine use and safety and better utilizing pharmacists' expertise to improve access to health care and support consumer's safety.<sup>35</sup> Such an initiative will assist in post-pandemic recovery.

#### 1.1.3. The Pharmacy Guild of Australia's emergency response plan for COVID-19

The Pharmacy Guild of Australia released guidelines for managing cold and flu symptoms during the COVID-19 pandemic, primarily focused on managing patient interaction, assessment, decision-making, and actions required, including situations requiring urgent medical attention. These guidelines were closely adopted from the FIP Health Advisory for community pharmacy practice during the COVID-19 pandemic.<sup>22</sup> These guidelines highlight that pharmacists are required to implement strategies that will be best suited to their pharmacy, based on their risk assessment level. Crucially, because pharmacy is an essential service, it is the responsibility of pharmacists to ensure an optimal supply of medicines, devices, and masks. Pharmacists are actively involved in educating customers about disease prevention, triaging and referring patients whenever required, and medication counselling. Further, and more importantly, services should be consistently provided, thereby ensuring quality without compromising the health and wellbeing of pharmacy staff.<sup>36</sup>

During the pandemic, pharmacies are required to communicate any changes in operating hours to the community and stakeholders because such changes may have several undesirable consequences. Communication and collaboration with neighborhood pharmacies about opening hours are greatly encouraged to prevent essential services from being disrupted.<sup>36</sup> The guidelines developed by the Pharmacy Guild for the management of cold and flu symptoms during COVID-19 (see Fig. 1) are one example of how social distancing policies, maintenance of personal and environmental hygiene, and triaging of patients to the respective government service have been implemented nationwide in pharmacies to prevent the spread of the disease. It is also essential that appropriate cleaning and disinfecting policies are implemented in pharmacies to minimize contamination by the virus.<sup>36</sup> Additionally, pharmacies were required to establish one-way traffic for entering and leaving the pharmacy. Clear markings on the ground have been used to indicate 1.5 m (see Fig. 2) between patients and staff and between customers waiting in a queue to reduce the number of people in the pharmacy at one time. Patients have been encouraged to contact pharmacies via telephone to request prescription processing to minimize time spent in the pharmacy. Pharmacy visits by vulnerable people have been reduced via home





The Pharmacy Guild of Australia

# Managing cold and flu symptoms *during* COVID-19

## 1 Manage Patient Interaction



Patients with cold and flu symptoms should be referred to a pharmacist for assessment



Take additional precautions to reduce risk of transmission (e.g. PPE, physical distancing, hand hygiene)



Patients who are very symptomatic (e.g. lots of coughing) or believe that they may have COVID-19 should be taken to a consultation room or isolated area and be given a mask immediately



## 2 Conduct Patient Assessment Consider the risk that the patient may have COVID-19

### Symptoms and relevant history

#### The most common symptoms



Cough



Fatigue



Shortness of Breath



Fever

#### Consider potential exposure risk:

- Close contact with a known COVID-19 case
- Health care worker
- Areas of local transmission / identified hotspots
- Travel overseas or on a cruise ship

#### Consider the patient's physical and mental function:

- Does their breathing appear affected?
- Are there changes to skin colour, e.g. blue lips?
- Do they appear confused?

#### Current reported incidence of COVID-19 symptoms

Cough	69%
Fatigue	38%
Shortness of breath	19%
Sputum	34%
Temperature 37.5–38°C	22%
Temperature > 38°C	22%
Muscle aches	15%
Sore throat	14%
Chills	12%
Nasal congestion	5%
Nausea or vomiting	5%
Diarrhoea	4%

Consider taking the temperature of patients with any of these symptoms, noting that up to 50% of patients with COVID-19 do not have a fever upon presentation.



## 3 Decision and Action

For any patients with potential COVID-19 symptoms, provide the patient with a mask immediately, and encourage them to self-isolate and arrange testing.

COVID-19 UNLIKELY	Potential COVID-19 BUT WELL	Potential COVID-19 UNWELL	Requires <b>URGENT</b> Medical Attention
<ul style="list-style-type: none"> <li>• Provide self-management advice and symptomatic medicines, e.g. paracetamol, decongestants, encourage fluids</li> </ul>	<ul style="list-style-type: none"> <li>• Encourage testing for COVID-19</li> <li>• Encourage self-isolation until COVID-19 results confirm diagnosis</li> <li>• Provide self-management advice and symptomatic medicines</li> </ul>	<ul style="list-style-type: none"> <li>• Encourage testing for COVID-19</li> <li>• Recommend patient contact their general practitioner</li> <li>• Encourage self-isolation</li> <li>• Provide self-management advice and symptomatic medicines</li> </ul>	<p><b>Immediately refer* patients with:</b></p> <ul style="list-style-type: none"> <li>• Severe shortness of breath</li> <li>• Difficulty breathing</li> <li>• Pain or pressure in chest</li> <li>• Cold, clammy or pale skin</li> <li>• New confusion</li> <li>• Blue lips or face</li> <li>• Coughing blood</li> </ul> <p><small>*Consider the need for an ambulance</small></p>

When deciding your action for a patient, consider co-morbidities that would place the patient at a higher risk of harm from COVID-19 (e.g. diabetes, immunocompromised, respiratory or cardiac conditions)

This infographic is not a validated clinical decision aid. Adapted from Australian Government, Coronavirus (COVID-19): Telehealth and consultations in GP respiratory clinics (Version correct as at 8 April 2020).

**Fig. 1.** Adapted from *Managing cold and flu symptoms*, 2020, The Pharmacy Guild of Australia, used with permission. (access data: 03/07/2020). <https://www.guild.org.au/news-events/news/forefront/v10n13/managing-cold-and-flu-symptoms>.

medication delivery or by asking family members, friends, or neighbors to act on their behalf where possible. The partnership between the Pharmacy Guild of Australia, the PSA, and the Department of Health has set new guidelines for community pharmacists that require them to limit dispensing of medicines (see [Tables 1–3](#)).<sup>27,36</sup>

### 1.1.4. The society of hospital pharmacists of Australia emergency response plan for COVID-19

The SHPA focused on upskilling the workforce to help manage the pandemic. Although the COVID-19 outbreak has caused a widespread and extensive damage to the world, it brings in a unique and once in lifetime opportunity for pharmacists to contribute to community as individuals and as a profession during this uncertainty.<sup>37</sup> In March 2020, the SHPA collected



Fig. 2. Picture obtained from a local pharmacy located at regional setting, and permission was granted for using.

over 800 signatures from pharmacists who were willing to support hospitals with anticipated understaffing. The SHPA provided free COVID-19 Hospital Pharmacy Relief Introductory Training to pharmacists with less than six months of experience, followed by the release of a free COVID-19 Hospital Pharmacy Intensive Care Unit upskilling package in early April. Furthermore, the SHPA provides COVID-19 related information through its information hub to guide its members to work effectively during the pandemic. Significantly, pharmacists from several other countries have participated in the SHPA's live webinars. Moreover, during April–May 2020, the SHPA conducted a survey focusing on medicine supply and workforce capacity to make a strategic plan in response to the government's actions to manage COVID-19. The SHPA provided a brief report to the TGA Medicines Shortages Working Group<sup>38</sup> based on the five-week survey data.

#### 1.1.5. The National Pharmaceutical Services Association emergency response plan for COVID-19

The NPSA has played a crucial role in maintaining the stock and distribution of more than 300 million medicines to Australians through pharmacies across the country during the pandemic.<sup>39</sup> The NPSA has been providing regular updates about stock availability to the government, the TGA, manufacturing companies, and the Pharmacy Guild.<sup>39</sup> During the COVID-19 crisis, the government initiated restrictions to control panic-buying—this is assisting greatly with the equitable supply of medicines across the country, including through regional pharmacies. According to an NPSA report, there was a historically high demand for more than 70 million PBS medicines during March and April 2020 due to COVID-19. The NPSA has also confirmed that there are currently shortages of some medicines due to the COVID-19 pandemic.

## 2. Discussion

This paper discusses the Australian pharmacy practice during the COVID-19 pandemic in relation to several policy initiatives implemented through Commonwealth legislation change. In this review paper, we attempted to highlight the Australian model of pharmacy practice, and some achievements and challenges which may be considered as a guidance and lesson for emergency preparedness planning to many other countries to optimise continuous access to medicines. Our findings showed that COVID-19 has imposed a significant burden on the Australian health care system, and pharmacists are experiencing the challenge of a lifetime. Travel restriction and lock down measures played significant role in the reduction of virus transmission. Major policy changes were implemented such as limit on dispensing of prescription and OTCs medicines, electronic prescribing, medication substitution right to pharmacists, telehealth service, and home medication review.

Australian pharmacists have been working collaboratively with multidisciplinary teams providing a crucial services at the frontline during the pandemic to ensure the equitable and safe supply of medicines despite the unprecedented situation which was also reported in a previous study.<sup>40</sup> However, it is unsurprising that people are facing some challenges related to obtaining their regular medicines and timely access to health care services due to pandemic restrictions and precautionary measures such as social distancing, quarantine policies, travel restrictions, and stay-at-home orders. Consequently, development of stress and anxiety in pharmacy customers due to medication shortage and unexpected difficulty to access medicines were reported. Customers

should understand that pharmacists are keeping their doors open to serve the community and that there is a high workload behind the scenes.

To our knowledge, this is the first article of its nature from Australia to provide comprehensive information about pharmacy practice during the time of COVID-19 pandemic. The status of the COVID-19 pandemic is continually changing; therefore, we ask readers to consider that we have attempted to provide up-to-date information at the time of writing this manuscript. The list of medication shortages in regional Victoria may differ from other areas of Australia—this list presented in this paper was based on the research team's expertise and discussion with colleagues who work in community pharmacies. The impact of COVID-19 on medication shortages and pharmacy workloads cannot be generalized to all regional areas or as a national scenario because different regions of Australia have been affected differently. Due to this review paper's nature, some of the opinions expressed therein solely comprise the research team's reflections. While we think we have done an extensive search for papers and, of course, tried our best to search for the relevant information, we acknowledge/admit that ample information might have been missed or changed or updated.

Restrictions on supply quantity and the provision of medication substitution rights to pharmacists were deemed appropriate because travel restrictions across countries badly disrupted the supply chain; further, Australia is heavily dependent on international supply for most medicines.<sup>6</sup> Undoubtedly, these strategies have helped manage panic-buying to a certain extent and, more broadly, contribute to the equitable supply of essential medications to pharmacy customers. We believe that such restriction favoured continued access of medicines for people living in residential facilities which have complex medication profile and needs. It is vital that those people have access to essential medications, including end-of-life medications, because it is now well known that COVID-related morbidity and mortality is high for this population.<sup>41</sup>

Despite some difficulties regarding adopting legislative changes and associated work pressure for pharmacists, digital prescribing has become vital—particularly to reduce face-to-face contact—and, ultimately, plays a pivotal role in infection control because patients are not required to sign their prescriptions to collect their medicines, and pharmacies are not required to store physical prescriptions. As the COVID-19 outbreak unfolded, the electronic prescription rollout is fast-tracked by the Australian Government to ensure Australians continue to access the Pharmaceutical Benefits Scheme (PBS) medicines they need. Electronic prescriptions are part of the broader digital health and medicines safety framework that enable the prescribing, dispensing, and claiming of medicines, without the need for a paper prescription. Patients confined to their home during COVID-19 with paper prescriptions or repeats can choose to receive their prescription via an app, SMS or email in the form of a link to a unique QR code or 'token'.<sup>42</sup> A recent study reported numerous advantages of Telehealth services, including reduced exposure to the virus for patients and health care providers, low demand for personal protective equipment, and decreased visits to emergency departments particularly during the pandemic.<sup>43</sup>

As per the initiatives implemented by the federal government, pharmacists can undertake a telephone medication review, telehealth for MedsCheck and Diabetes MedsCheck at PBS prices. Additionally, the home delivery of medicines to vulnerable people and those in home isolation reduced the number of visits to pharmacies, which may have contributed to infection reduction by limiting face-to-face contact. These approaches implemented by the Australian federal government in collaboration with state governments and pharmacy stakeholders, may have aided the government plan to contain the infection through social distancing measures. Keeping the infection and death rates markedly low (compared to other developed countries) is a testament to the Australian governments' successful and rapid action, supported by the general public adhering to self-isolation and quarantine requirements.<sup>44</sup> Digital prescription handling, medication substitution, virtual

medication consultation, and home drug delivery were some of Australia's approaches, thereby extending the legal roles of pharmacists, as in certain European countries, Canada, and the USA.<sup>13</sup> The home delivery of medications to people in isolation during the pandemic has been challenging as pharmacists could not offer face-to-face counselling, and it is relatively easy to misinterpret written instruction. Telehealth counselling is also challenging, particularly for older people who may have hearing impairments; however, volume can be adjusted in electronic communication.

The entire world is affected by the current pandemic; therefore, there is a substantial risk of shortages of some essential medicines.<sup>45</sup> Even in a very developed country such as the UK,<sup>46</sup> there occurred a severe shortage of prescription and OTC medicines. After COVID-19 hit, Australia also reported shortages of some medicines at local and national levels<sup>47</sup>—such shortages are expected to persist for the foreseeable future because Australia imports 70% of its most frequently used medicines from India, and China is the major supplier of active pharmaceutical ingredients (80%).<sup>48</sup> Shortages have also been flagged by a colleague of the research team, a community pharmacist from a regional town in Victoria, particularly of medicines such as angiotensin-converting enzyme inhibitors, angiotensin receptor II antagonist, selective serotonin reuptake inhibitors, serotonin and norepinephrine reuptake inhibitors, beta-blockers, calcium channel blockers, and even for glaucoma eye drops. Off-label use of hydroxy-chloroquine in Australia has also presented a concerning issue for a potential shortage, particularly after President Trump's announcement on March 20, 2020,<sup>49</sup> that this drug has potentially positive effects on patients affected by COVID-19.<sup>50</sup> In Australia, medicine shortages have been more severe in rural pharmacies.<sup>51</sup> Pharmacists should play a vital role in contacting prescribers and making necessary adjustments. In general, medication shortage in Australia has been more concerning for smaller independently owned pharmacies that depend on monthly turnover; conversely, larger pharmacies with chain have effective stock control mechanisms for long-term storage. Medication shortages is associated with detrimental outcomes such as prescribing suboptimal therapy, medication error, the economic burden for patients, and the high prevalence of adverse events, including mortality.<sup>52–54</sup> Medication shortages also have a significant impact on the safety of people living with existing disease, even if they are not affected by COVID-19.<sup>55</sup> In Australia, research is emerging in this area to investigate the impact of medication shortages and the worsening of different outcomes (as demonstrated above) during the COVID-19 period.

Pharmacy customers may likely develop severe frustration and anxiety due to difficulties in gaining access to their regular medicines due to the pandemic. Some unexpected and distressing incidents have been recorded in regional areas in Australia. On April 7, 2020, the Australian Broadcasting Corporation News reported that four pharmacy staff had quit their jobs after a pharmacist in regional New South Wales was spat on and punched in the face by a customer due to anxiety associated with the pandemic.<sup>56</sup> According to the news, local pharmacy staff have been facing verbal and physical abuse almost daily. A UK study showed that more than 60% of 206 participating pharmacists had faced inappropriate behaviour by customers, particularly due to drug shortages, unavailability of medicines, long waiting times, physical distancing, and no-cash policies.<sup>46</sup> On top of encountering such abusive behaviours, pharmacists experienced additional workplace pressure exacerbated by COVID-19 as there was foreseeable increase in the number of people waiting for vaccinations in community pharmacies. A pharmacist from Newcastle, Australia, explained that they were performing 50 to 70 influenza vaccinations per day, representing a tremendous degree of added workload.<sup>56</sup> Two pharmacies were unable to provide vaccination services, as explained in a recent national survey in Australian. Additionally, according to the survey, overall work pressure and daily functioning of pharmacies in regional areas (32%) were more significantly affected by the pandemic than those in metropolitan areas (21%).<sup>57</sup> A recent study demonstrated that Australian pharmacists



are affected by burnout particularly due to working extra hours, challenges to medication supply management, and unsociable behaviours exhibited by pharmacy customers.<sup>58</sup> Support services to improve psychological wellbeing is crucial as the impact of COVID-19 in mental health of pharmacists could be extremely detrimental.

The Australian government recommends immunization against influenza for all people to be protected from the consequences of influenza infection. One million influenza vaccine doses were supplied to community pharmacies between April and May 2020, which is more than the total number of vaccines provided in 2019. The Commonwealth Government committed to supporting an additional three million vaccines between May and June 20, 20.<sup>39</sup> A recent Australian survey highlighted higher demand for influenza vaccination in pharmacies in 2020 than ever before, leading to a shortage of these vaccines.<sup>57</sup> Further, the survey demonstrated that pharmacies were under additional work pressure due to COVID-19 related workload or requirements to be implemented, such as extensive cleaning, physical distancing policies, restrictions on face-to-face meetings with patients, and staff shortages.<sup>57</sup> Shortage in the supply of vaccine coupled with the shortage or over-worked pharmacy workforce possessed huge challenge in provision of influenza vaccine to the population. It is noteworthy that there is an evidence about increased tendency of potential medication errors due to increased workload and stress among pharmacists.<sup>59</sup>

A recent scoping review about the role of pharmacists during COVID-19 highlighted that most of the 11 included studies focused on hospital pharmacists' role.<sup>60</sup> As members of COVID-19 teams, Australian hospital pharmacists were involved in ward rounds, medication storage, ensuring the availability of critical medications, medication reconciliation, and therapeutic decision-making.<sup>23</sup> In Australia, the majority of pharmacy graduates (67%) are working in community pharmacy settings<sup>61</sup> followed by 20% in hospital pharmacy settings.<sup>62</sup> Approximately 95% of consumers live within 2.5 km of a local pharmacy, demonstrating that community pharmacies are often the first point of contact for those seeking information during outbreaks such as COVID-19.<sup>61</sup> Crucially, the national survey showed that the pharmacy is one of the most trusted and respected professions in Australia; further, it was demonstrated that 95% of customers were satisfied with their community pharmacy services.<sup>61</sup> Community pharmacists in Australia had central role to manage cold and flu symptoms, initial assessment and referring patients to GPs and hospitals when required. Other roles of the community pharmacists were home-medication review through telehealth, and providing flu vaccination as described previously. Importantly, COVID-19 vaccination in community pharmacy in Australia officially started on 7th of June 20, 21.<sup>63</sup>

Adherence to social distancing protocols while customers are within the pharmacy premise is challenging, particularly for small independently owned pharmacies, such as in regional cities. This could have reduced the inflow of customers into the pharmacy for obtaining regular prescriptions and minor ailment consultations with the pharmacist. Moreover, it remains unclear if social distancing in community pharmacy would have led to patients turning to emergency department or waiting for their next doctors' appointment. Further investigation is required to establish the potential causal relationship. There are a few other impacts of social distancing requirement in the pharmaceutical field in Australia. The PSA has also advised that it is suspending its events and conferences at state and national levels. At a national level, one other impact of COVID-19 was that the Australian Pharmacy Council (APC), a legal body for the accreditation of pharmacy education and training in Australia and New Zealand, announced the cancellation of the June 2020 Knowledge Assessment of Pharmaceutical Sciences (KAPS) exam. This exam is a mandatory knowledge assessment exam for pharmacists who have graduated overseas; they must sit the exam before beginning an internship in Australia. APC also cancelled the April intern written exams due to COVID-19.<sup>64</sup> Further, patients must sometimes wait weeks before they can see their general practitioner or have telehealth consultations.

Like other frontline health care professionals, pharmacists play an integral role in combating the global challenges caused by COVID-19.<sup>65,66</sup> Few frontline pharmacists have died due to COVID infection, contracted while serving their communities—at least one pharmacist in China,<sup>67</sup> five pharmacists in the UK,<sup>68</sup> and nine pharmacists in Italy.<sup>69</sup> These reports potentially add to highly stressful situations in pharmacy practice. Despite the frightening aspects of the current crisis, Australian pharmacists are working continuously in responding to COVID-19 showing their dedication and professionalism as per the duty of care to provide patient-centered care, potentially putting themselves at risk. As per our knowledge, there are no reported deaths of pharmacists or pharmacy personnel in Australia, although infection cases have been recorded.

Whilst the vaccines for COVID-19 has been developed and other efforts to improve pharmaceutical interventions for COVID-19 are in progress, the understanding of the social and behavioural aspects can provide important insights to manage and prevent its impact. Substantial behaviour change is warranted to slow the viral transmissions during pandemics. Behaviour change however is influenced by several facets of social, cultural and administrative contexts such as social norms, social inequality, culture and polarization. People are influenced by their social norms but their perceptions are often inaccurate.<sup>59</sup> For instance, people often underestimate 'hand washing' - a health-promoting behaviour while they overestimate unhealthy behaviours. Positive norms can be reinforced to change behaviours by correcting such misperception.<sup>70</sup> Inequalities in access to resources on the other hand affect not only who is at greatest risk of infection but also who is able to adopt recommendations to slow the spread of the disease.<sup>71</sup> For example, families deprived of clean water face difficulties washing their hands frequently or as directed by guidelines, physical distancing may be practically impossible in settings such as prisons, refugee camps and immigrant detention centers. Similarly, cultural variation especially in the alleged independent cultures (most of Western Europe and North America) that endorse individualism.<sup>72</sup> might have more likelihood of interpersonal transmission of the virus compared to the interdependent cultures (Asian societies).<sup>71</sup>

Australia has thus far been among the more successful developed states in the world, in slowing the spread of the COVID-19.<sup>73</sup> Early physical distancing measures, a stable political system and geographic isolation may have contributed to its relative success in dealing with the pandemic. The pandemic has however exacerbated existing social inequalities, highlighted public racism, showed disparities in access to digital technologies, illustrated increased demands on mental health services and a possible over-reliance on some export industries. The policy choices the government has made recently and the future choices will have long-term impacts across all areas of social and economic life.<sup>74</sup>

Based on the governments' phase 2A vaccine rollout program, appropriately trained pharmacists are administering vaccines for COVID-19 in eligible people. Jurisdictional regulations across all states and territories were adjusted to facilitate this. There is a high demand for access to the vaccine and a significant public health interest in achieving a high immunization level in the community. Pharmacists are well-positioned at the frontline to provide vaccination services to the community, increasing the chance of reaching herd immunity.

### 3. Conclusions

Pharmacists are working actively at the frontline during the current COVID-19 outbreak to provide a range of advanced pharmacy services in Australia and internationally. The major pharmaceutical organizations in Australia aligned to support the government's strategic plan for fighting COVID-19, and established an emergency response plan for COVID-19 to guide pharmacists and members in providing quality pharmacy services. Further, these organizations are striving toward the common goal of maintaining equitable supply and continued access to

therapeutic goods for appropriate consumers. The policies and practices implemented by the government are vital to retain the quality of health provisions, including pharmaceutical care. Further research is needed to gain additional in-depth insight into expanding pharmacists' roles based on competence shown during the pandemic—to make long-term changes and develop a standard and sustainable pharmacy practice for future pandemic preparedness.

## Acknowledgement

The authors would like to extend our appreciation to Associate Professor Barbara Mintzes (The University of Sydney) for providing valuable suggestion while preparing this draft.

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